

**ULDB  
Systems  
Definition  
Review**

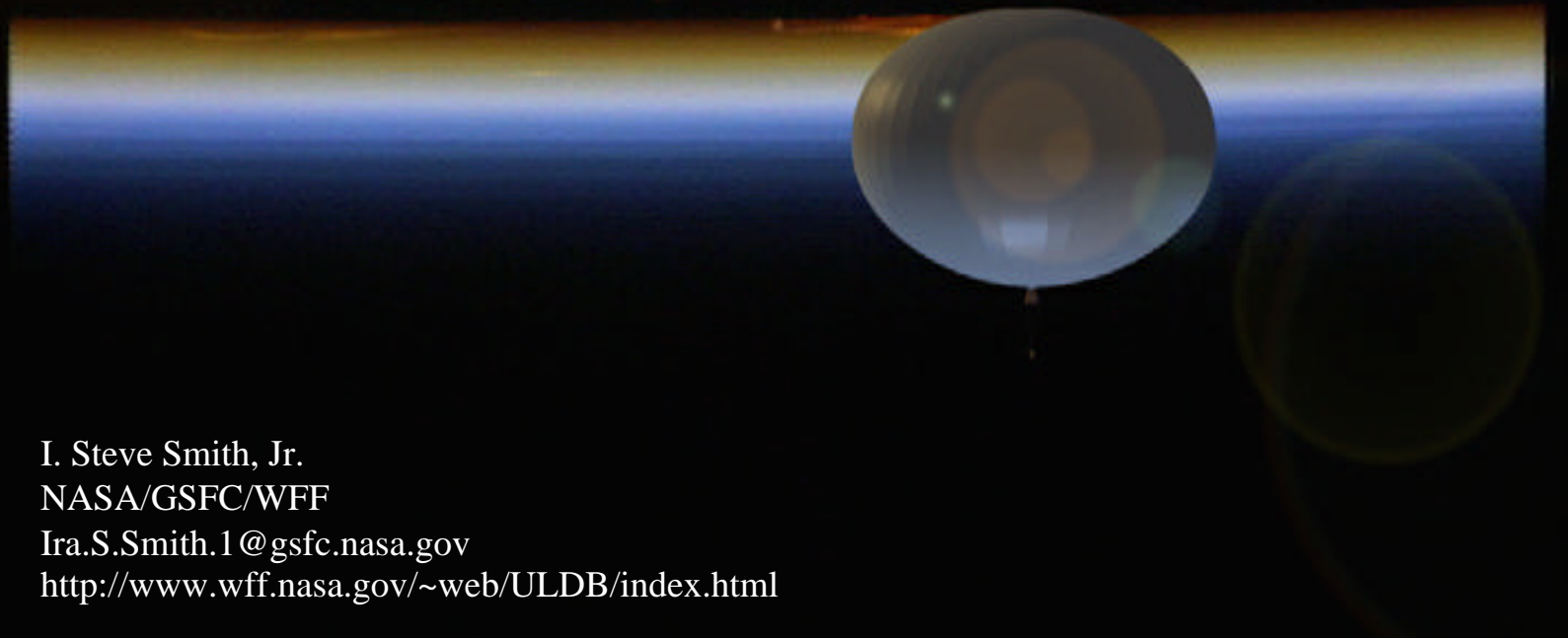
**Project  
Overview**

**March 25, 1998**

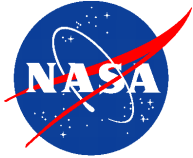
**I. Steve Smith, Jr.**

# Ultra Long Duration Balloon Project (ULDB)

## Project Overview



I. Steve Smith, Jr.  
NASA/GSFC/WFF  
Ira.S.Smith.1@gsfc.nasa.gov  
<http://www.wff.nasa.gov/~web/ULDB/index.html>

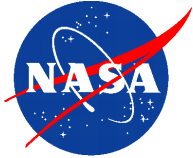


**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# Agenda

8:30	Introduction	Smith
8:45	Overview	Smith
9:15	TIGER Science Instrument	Hink
9:45	Break	
10:00	Balloon Vehicle & Recovery Systems	Cathey
12:00	Lunch	
1:00	Ballooncraft	Stuchlik
3:00	Break	
3:15	Mission & Operations	Gregory
4:00	Summary	Smith
4:30	Adjourn	

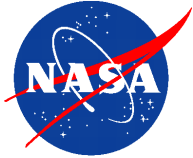


**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# Review Team

<b>Louis Vosteen/Chairman</b>	LaRC, Retired
Michael Viens	541.0
Thomas Budney	570.0
David Shrewsberry	800.0
Robin Mauk	546.0
Joseph Duke	800.0
Joel Simpson	571.0
Philip Eberspeaker	546.0
Philip Copeland	PSL/NSBF



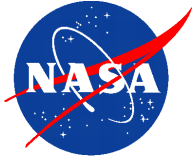
ULDB  
Systems  
Definition  
Review

Project  
Overview

# Objective

**Develop and Demonstrate the Technical Feasibility of a Low Cost, Integrated, Advanced Long Duration Balloon System Capable of Supporting Global Scientific Observations Above 99% of the Earth's Atmosphere for Durations Approaching 100 Days.**

March 25, 1998  
I. Steve Smith, Jr.



ULDB  
Systems  
Definition  
Review

Project  
Overview

March 25, 1998  
I. Steve Smith, Jr.

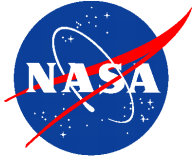
# Scope & Guidelines

## Scope

To Build Upon the Balloon Philosophy and Legacy in the Identification, Adaptation and Implementation of Relevant Technologies Found in the Aeronautical, Spacecraft and Military Environments in Order to Develop a New Science Support Capability.

## Guidelines

- Demonstrate Viability of New Carrier for Accomplishing Meaningful Science
- Demonstrate Necessary Technologies Associated with 100 Day Missions
- No New Program Money Identified
- Use Civil Service Personnel to Largest Extent Possible



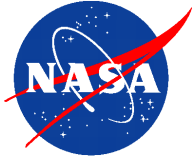
**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# **Project Approach**

- **Demonstrate New Carrier Capability by the End of Year 2000.**
- **Primary Funding From Within Balloon Program -- No New Funds Identified**
- **ULDB Does Not Replace Existing Balloon Program**
- **Balloon Technology Development On-going in Parallel w/ ULDB Development Effort**
- **Fast Track Project**
- **Leverage off of LDB Program**
- **Incorporate New Technology As Funds and Schedule Allow**
- **Pursue Additional Technology Funding Sources**
- **Integrated Science and Technical Management, Development and Implementation Team**
- **Integrated Management Team (IMT) : Comprised of Project, Systems and Science Instrument Managers**
- **Technical Advisory Group (TAG) : Composed of Science & Technical Personnel Appointed to Review Development Progress**

**March 25, 1998  
I. Steve Smith, Jr.**

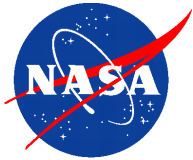


**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# Background & Status

- Jun 96 - “100 Day” Ballooning Planning Meeting Held at GSFC
- Oct 96 - HQ Funded Requirements & Technologies Study for Long Duration Balloon Missions (Polidan Study)
- Nov 96 - Workshop Held to Identify Science Requirements & Supporting Technologies for Use By Polidan Study
- Feb 97 - Balloon Program Plan & Resources Defined for ULDB Development Effort
- Feb 97 - First Hangar Balloon Test of New Composite Material
- Apr 97 - Demonstration 2000 Science Candidates Identified
- May 97 - Integrated Management Team (IMT) Established
- Jun 97 - ULDB Technology Workshop Conducted at GSFC
- Sep 97 - WFF Personnel Assigned to Development Team
- Oct 97 - Requirements Defined
- Nov 97 - Mission Definition Review Held
- Jan 98 - Code I Meeting to Discuss International Overflight
- Feb 98 - ULDB Demo 2000 Science Instrument Selected

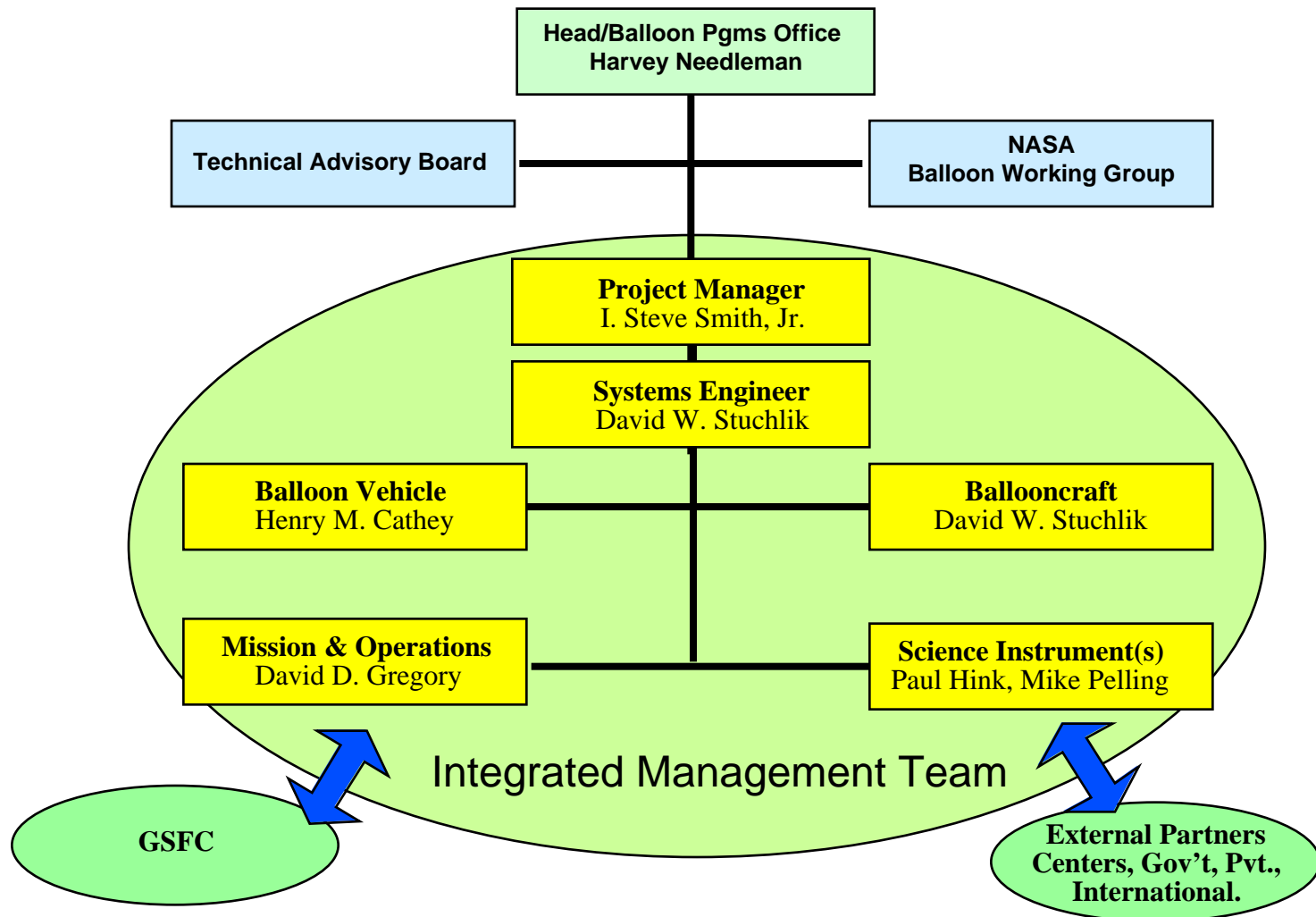


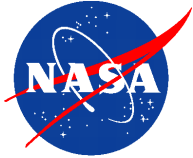
**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

March 25, 1998  
I. Steve Smith, Jr.

# Organizational Structure



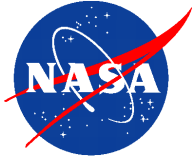


**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# **Management Plan**

- **IMT: Bi-Weekly Telecons**
- **Bi-Weekly Sub-System Progress Meetings**
- **Monthly Budget & Progress Reports**
- **Monthly Project Status with Head/820**
- **Alternating Site Quarterly Reviews (WFF, Washington University)**
- **Reviews (MDR, SDR, PDR, CDR, MRR)**
- **Technical Advisory Group (TAG) for Reviews**
- **Document, Interface & Configuration Control**
- **Web Site Information Dissimination**

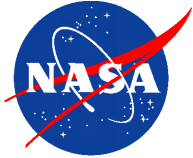


ULDB  
Systems  
Definition  
Review

Project  
Overview

# Candidate Science Instruments

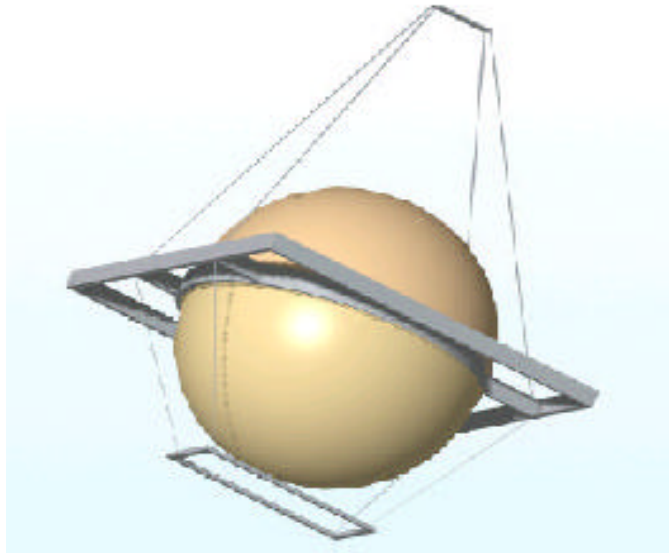
<u>Discipline</u>	<u>PI</u>	<u>INSTITUTION</u>
Cosmic Ray	Binns (TIGER)	WashU St. Louis
Cosmic Ray	Evenson (BACH)	Bartol Inst.
Gamma Ray	Leventhal (GRIS)	UMd/NRL
Gamma Ray	Lin (HIREGS)	UC Berkeley
InfraRed	Cheng (TopHat)	GSFC
InfraRed	Lubin (ACE)	UC Santa Barbara



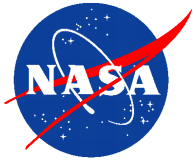
**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# Primary Instrument: TIGER



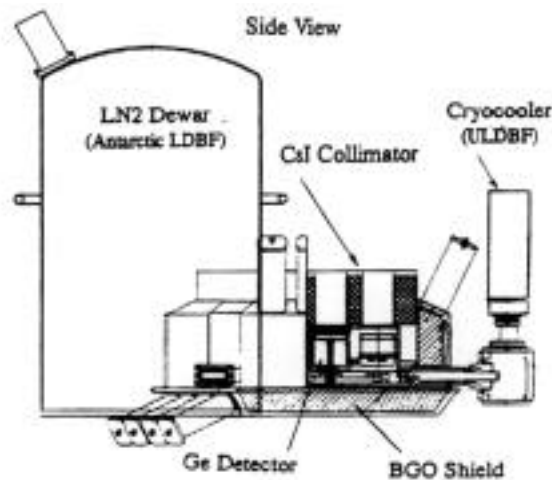
- |                   |                                   |
|-------------------|-----------------------------------|
| • Science         | <b>Cosmic Ray</b>                 |
| • PI              | <b>Robert Binns</b>               |
| • Institution     | <b>Wash. U.</b>                   |
| • Payload Manager | <b>Paul Hink</b>                  |
| • History         | <b>Flt. Proven</b>                |
| • Telemetry       | <b>4.4 - 5.7 kbps</b>             |
| • Cryogenics      | <b>No Rqmt.</b>                   |
| • Mass            | <b>540 kgs</b>                    |
| • Power           | <b>222 W day,<br/>522 W night</b> |
| • Pointing        | <b>No Rqmt.</b>                   |
| • Commanding      | <b>&lt; 1 per day</b>             |
| • Altitude        | <b>&gt; 32.8 kms.</b>             |
| • Flight Latitude | <b>&gt; 30 S</b>                  |



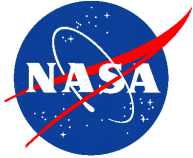
**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# Back-Up Instrument: HIREGS



- |                   |                        |
|-------------------|------------------------|
| • Science         | <b>Gamma Ray</b>       |
| • PI              | <b>Robert Lin</b>      |
| • Institution     | <b>UC/Berkeley</b>     |
| • Payload Manager | <b>Michael Pelling</b> |
| • History         | <b>Flt. Proven</b>     |
| • Telemetry       | <b>10 kbps</b>         |
| • Cryogenics      | <b>3 Cryo-Coolers</b>  |
| • Mass            | <b>616 kgs</b>         |
| • Power           | <b>627 W</b>           |
| • Pointing        | <b>0.2 Degree</b>      |
| • Commanding      | <b>4 per day</b>       |
| • Altitude        | <b>&gt; 35 kms.</b>    |
| • Flight Latitude | <b>&lt; 45 S</b>       |



**ULDB  
Systems  
Definition  
Review**

**Project  
Overview**

# **Technical Approach**

- **Define & Document Requirements**  
(820-ULDB-DTRD-001.0)
- **Identify Functional Elements**
- **Define Work Breakdown Structure**
- **Define Mission (MDR)**
- **Perform Trade Studies**
- **Define Systems To Meet Requirements**
- **Demonstrate Mission Feasibility (SDR)**
  - Technical
  - Budget
  - Schedule

**March 25, 1998**  
I. Steve Smith, Jr.